

## Appendix A References

### A-1. Industry Standards

American National Standards Institute:

American Gear Manufacturers Association, 1994, ANSI/AGMA Standard 9005-D94, *Industrial Gear Lubrication*, Alexandria, VA.

American Gear Manufacturers Association, 1995, ANSI/AGMA Standard 1010-E95, *Appearance of Gear Teeth - Technology of Wear and Failure*, Alexandria, VA.

National Fluid Power Association, 1990 (R1994), ANSI/NFPA Standard T3.10.8.8, ISO 4572, *Hydraulic Fluid Power - Filters - Multi-Pass Method for Evaluating Filtration Performance*, Milwaukee, WI.

American Gear Manufacturers Association. 1974. AGMA Standard 201.02, *ANSI Standard System Tooth Proportions for Coarse - Pitch Involute Spur Gears*, Alexandria, VA.

Institute of Electrical and Electronics Engineers, Inc. 1991. IEEE Standard C57.104-1991, *IEEE Guide for the Interpretation of Gases*.

American Society for Testing and Materials (ASTM) Standards:

D 95, Test Methods for Water in Petroleum Products and Bitumenous Materials by Distillations.

D 97, *Standard Test Methods for Pour Point of Petroleum Oils*.

D 130, Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test.

D 217, *Standard Test Methods for Cone Penetration of Lubricating Grease*.

D 445, Test Methods for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity).

D 566, *Standard Test Method for Dropping Point of Lubricating Grease*.

D 664, Test Method for Neutralization Number by Potentiometer Titration.

D 665, Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water.

D 892, *Standard Test Method for Foaming Characteristics of Lubricating Oils*.

D 942, *Standard Test Method for Oxidation Stability of Lubricating Greases by the Oxygen Bomb Method*.

- D 943, *Standard Test Method for Oxidation Characteristics of Inhibited Mineral Oils.*
- D 972, *Standard Test Method for Evaporation Loss of Lubricating Greases and Oils.*
- D 974, *Test Method for Neutralization Number by Color-Indicator Titration.*
- D 1092, *Standard Test Method for Measuring Apparent Viscosity of Lubricating Greases.*
- D 1263, *Standard Test Method for Leakage Tendencies of Automotive Wheel Bearing Greases.*
- D 1264, *Standard Test Method for Determining the Water Washout Characteristics of Lubricating Greases.*
- D 1401, *Test Method for Water Solubility of Petroleum Oils and Synthetic Fluids.*
- D 1403, *Standard Test Method for Cone Penetration of Lubricating Grease Using One-Quarter and One-Half Scale Cone Equipment.*
- D 1500, *Test Method for ASTM Color of Petroleum Products (ASTM Color Scale).*
- D 1742, *Standard Test Method for Oil Separation from Lubricating Grease During Storage.*
- D 1743, *Standard Test Method for Determining Corrosion Preventive Properties of Lubricating Greases.*
- D 1744, *Test Method for Water in Liquid Petroleum Products by Karl Fischer Reagent.*
- D 1831, *Standard Test Method for Roll Stability of Lubricating Grease.*
- D 2161, *Method for Conversion of Kinematic Viscosity to Saybolt Universal Viscosity or to Saybolt Furol Viscosity.*
- D 2265, *Standard Test Method for Dropping Point of Lubricating Grease Over Wide-Temperature Range.*
- D 2266, *Standard Test Method for Wear Preventive Characteristics of Lubricating Grease (Four-Ball Method).*
- D 2270, *Standard Test Method for Calculating Viscosity Index From Kinematic Viscosity at 40 and 100 °C.*
- D 2272, *Rotating Bomb Oxidation Test (RBOT).*
- D 2509, *Standard Test Method for Measurement of Extreme Pressure Properties of Lubricating Grease (Timken Method).*
- D 2595, *Standard Test Method for Evaporation Loss of Lubricating Greases Over Wide-Temperature Range.*

D 2596, *Standard Test Method for Measurement of Extreme-Pressure Properties of Lubricating Grease (Four-Ball Method)*.

D 2882, *Method for Indicating the Wear Characteristics of Petroleum and Non-Petroleum Hydraulic Fluids in a Constant Vane Pump*.

D 3232, *Standard Test Method for Measurement of Consistency of Lubricating Greases at High Temperatures*.

D 3336, *Standard Test Method for Performance Characteristics of Lubricating Greases in Ball Bearings at Elevated Temperatures*.

D 3847, *Standard Specification for Mineral Insulating Oil Used in Electrical Apparatus - Type II Mineral Oil - Practice for Rubber-Directions for Achieving Abnormal Test Temperatures*.

D 4048, *Standard Test Method for Detection of Copper Corrosion from Lubricating Grease*.

D 4049, *Standard Test Method for Determining the Resistance of Lubricating Grease to Water Spray*.

D 4059, *Test Method for Analysis of Polychlorinated Biphenyls in Insulating Liquid by Gas Chromatography Method*.

D 4170, *Standard Test Method for Fretting Wear Protection by Lubricating Greases*.

D 5864, *Standard Test Method for Determining Aerobic Aquatic Biodegradation of Lubricants or Their Components*.

D 02.12A, *Proposed Standard Practice for Aquatic Toxicity Testing of Lubricants*.

F 311, *Practice for Processing Aerospace Liquid Samples for Particulate Contamination Analysis Using Membrane Filters*.

F 312, *Method for Microbial Sizing and Counting Particles from Aerospace Fluids on Membrane Filters*.

## **A-2. Other Standards**

Coordinating European Council (CEC). 1994. CEC-L-33-A-94, *Biodegradability of Two Stroke Outboard Engine Oil in Water*, Coordinating European Council.

Environmental Protection Agency (EPA). 1982. EPA 560/6-82-002, Sections EG-9, ES-6, *Guidelines and Support Documents for Environmental Effects Testing*, Environmental Protection Agency, Washington, DC.

Environmental Protection Agency (EPA). 1982. EPA 560/6-82-003, number CG-2000, *Aerobic Aquatic Biodegradation*, Environmental Protection Agency, Washington, DC.

Organization for Economic Cooperation and Development (OECD), OECD 203, 1993, *Guideline for Testing of Chemicals, Fish Acute Toxicity Test*, Organization for Economic Cooperation and Development, Paris, France.

Organization for Economic Cooperation and Development (OECD), OECD 301B, 1993, *Guideline for Testing of Chemicals, Ready Biodegradability: Modified Sturm Test*, Organization for Economic Cooperation and Development, Paris, France.

Society of Automotive Engineers (SAE). 1985. SAE Recommended Practice J 1707, *Service Maintenance of SAE J 1703, Brake Fluid in Motor Vehicle Brake Systems*, Warrendale, PA.

Society of Automotive Engineers (SAE). 1991. Specification J 1703, *Motor Vehicle Brake Fluid*, Warrendale, PA.

U.S. Department of Transportation. Federal Motor Vehicle Safety Standard (FMVSS) No. 16 (DOT3), *Motor Vehicle Brake Fluid*, Washington, DC.

### **A-3. Government Reports**

#### **Beitelman 1996**

Beitelman, A. D. May 1996. *Environmentally Friendly Lubricants*, The REMR Bulletin, Vol. 13, No. 2, Department of the Army, Washington, DC.

#### **Beitelman and Clifton 1989**

Beitelman, A. D., and Clifton, W. B. 1989. *Lubricants for Hydraulic Structures*, Technical Report REMR-EM-5, Department of the Army, Washington, DC.

#### **Campbell 1972**

Campbell, M. E. 1972. *Solid Lubricants: A Survey*, First Edition, U.S. Government Printing Office, Washington, DC.

#### **Cline 1990**

Cline, R. 1990. *Lubrication of Powerplant Equipment*, U.S. Bureau of Reclamation, Colorado.

#### **General Services Administration**

General Services Administration. Index of Federal Specifications, Standards, and Commercial Item Descriptions, Washington, DC.

#### **U.S. Army Corps of Engineers Louisville District, August 1997**

U.S. Army Corps of Engineers Louisville District. August 1997. "Olmsted Prototype Hydraulically Operated Navigable Pass Wicket Dam, Final Report," U.S. Army Corps of Engineers Louisville District, KY.

#### **U.S. Bureau of Reclamation 1980**

U.S. Bureau of Reclamation. 1980. *Facilities, Instructions, Standards, and Techniques (FIST)*, Vol 3-5, *Maintenance of Liquid Insulation Mineral Oils and Askarels*, Washington, DC.

**U.S. Department of Defense**

U.S. Department of Defense. *DoD Index of Specifications*, Washington, DC.

**U.S. Bureau of Reclamation Mid-Pacific Regional Office 1997**

U.S. Bureau of Reclamation Mid-Pacific Regional Office. July 1997. *"Folsom Dam Spillway Gate 3 Failure Investigation Trunnion Fixture Test,"* U.S. Bureau of Reclamation Mid-Pacific Regional Office, Sacramento, CA.

**A-4. Department of Defense Policies and Procedures**

DOD 4120.3-M

Defense Standardization Program, Policies and Procedures

**A-5. Text Publications**

**Oberg 1988**

Oberg, E. 1988. *Machinery's Handbook*, 23rd Revised Edition, Industrial Press, New York.

**Oberg 1992**

Oberg, E. 1992. *Machinery's Handbook*, 24th Revised Edition, Industrial Press, New York.

**American Society for Metals 1993**

American Society for Metals. 1993. *ASM Handbook Volume 18, Friction, Lubrication, and Wear Technology*, First Edition, ASM International.

**Avallone and Baumeister 1996**

Avallone, E. A., and Baumeister III, T. 1996. *Marks' Standard Handbook for Mechanical Engineers*, Tenth Edition, McGraw Hill, New York, NY.

**Boehringer 1992**

Boehringer, R. H. 1992. "Grease," in *ASM Handbook, Volume 18, Friction, Lubrication, and Wear Technology*, ASM International, U.S.A., p123.

**Booser 1983**

Booser, E. R. 1983. *CRC Handbook of Lubrication (Theory and Practice of Tribology)*, Volume I, Application and Maintenance, CRC Press, Inc., Boca Raton, FL.

**Booser 1984**

Booser, E. R. 1984. *CRC Handbook of Lubrication (Theory and Practice of Tribology)*, Volume II, Theory and Design, CRC Press, Inc., Boca Raton, FL.

**Booser 1994**

Booser, E. R. 1994. *CRC Handbook of Lubrication (Theory and Practice of Tribology)*, Volume III, Monitoring, Materials, Synthetic Lubricants, and Application, CRC Press, Inc., Boca Raton, FL.

**Braithwaite 1964**

Braithwaite, E. R., 1964, *Solid Lubricants and Surfaces*, First Edition, Macmillan Company, New York, NY.

**Bridon American 1997**

Bridon American. 1997. Technical Bulletin, *Rope Lubrication and Preservation in Service*, Bridon American, Wilkes-Barre, PA.

**Conoco 1981**

Conoco. 1981. *Lubrication Manual*, Conoco Inc.

**Electric Power Research 1993**

Electric Power Research Institute (EPRI). 1993. *Report EPRI GS-7352*, Palo Alto, CA.

**Exxon 1998**

Exxon. 1998. *Exxon Lubricants Maintenance Conference*, New Orleans, LA.

**Fitch 1997**

Fitch, J. C. 1997. *Strategic Elements of a Successful Oil Analysis Program*, Noria Corporation, Tulsa, OK.

**Gulliver and Arndt 1991**

Gulliver, J. S., and Arndt, R. E. A. 1991. *Hydropower Engineering Handbook*, First Edition, McGraw-Hill, Inc., New York, NY.

**International Standards Organization 1987**

International Standards Organization. 1987. *Hydraulic Fluid Power—Fluids—Method for Coding Level of Contamination by Solid Particles*, Geneva, Switzerland.

**Lubrizol 1997**

Lubrizol. 1997. *Grease Ready Reference*, Lubrizol Corporation, OH.

**Mancuso and South 1994**

Mancuso, J. R., and South, D. W. 1994. *Mechanical Power Transmission Components*, First Edition, Marcel Dekker, Inc., New York, NY.

**National Lubricating Grease Institute 1996**

National Lubricating Grease Institute. 1996. *Lubricating Grease Guide*, Fourth Edition, National Lubricating Grease Institute, MO.

**Neale 1993**

Neale, M. J. 1993. *Lubrication: A Tribology Handbook*, First Edition, *Society of Automotive Engineers*, Butterworth-Heinemann Ltd, Oxford, England.

**Noria Corporation 1998**

Noria Corporation. 1998. *Oil Analysis: The Complete Course for Professionals*, Tulsa, OK.

**Pall Industrial Hydraulics Company 1997**

Pall Industrial Hydraulics Company. 1997. *Contamination Control and Filtration Fundamentals*, Pall Corporation, Glen Cove, NY.

**Parker Hannifin 1997**

Parker Hannifin. 1997. *Industrial Hydraulic Technology*, Second Edition, Parker Hannifin Corporation, Cleveland, OH.

**Sperry Vickers 1970**

Sperry Vickers. 1970. *Industrial Hydraulics Manual*, Sperry Corporation, Troy, MI.

**Williams 1994**

Williams, J. A. 1994. *Engineering Tribology*, First Edition, Oxford University Press, New York, NY.

**A-6. Periodicals, Journals, and Conference Papers**

**Abou-Haidar 1995**

Abou-Haidar, A. N. May 1995. *Avoiding Troubles in Large Gear Boxes*, Plant Engineering.

**American Society of Lubrication Engineers 1975**

American Society of Lubrication Engineers (ASLE). 1975. *Effect of Water in Lubricating Oil on Bearing Life*, 31st Annual ASLE Meeting. (Changed to: Society of Tribologists and Lubrication Engineers (1987).) Park Ridge, IL.

**Barbacki 1998**

Barbacki, S. January 1998. *Lube-free Chains Reduce Maintenance*, Plant Engineering.

**Barrett 1996**

Barrett, C. D. May/June 1996. *The Current Status of Heavy-Duty Open Gear Drive Lubrication*," IEEE Transactions on Industry Applications, Vol. 32, No. 3, p 678.

**Barrett and Bjel 1994**

Barrett, C., and Bjel, I. August 1994. *Use of High Viscosity Base Oil Gels for Heavy Duty Open Gear Drive Lubrication*, NLGI Spokesman, Vol. 58, No. 5, p 13.

**Beitelman 1998**

Beitelman, A. D. April 1998. "Time for a Change? Assessing Environmentally Acceptable Lubricants," *Hydro Review*.

**Cella 1997**

Cella, A. F. April 1997. *Oil, Filters, and the Environment*, Plant Engineering.

**Cheng, Wessol, Baudouin, BenKinney, and Novick 1994**

Cheng, V. M., Wessol, A. A., Baudouin, P. M., BenKinney, T., and Novick, N. J. April 1994. *Biodegradable and Nontoxic Hydraulic Oils*, 42nd Annual Society Automotive Engineers (SAE) Earthmoving Industry Conference, Paper 910964.

**Eichenberger 1991**

Eichenberger, H. F. April 1991. "Biodegradable Hydraulic Lubricant - An Overview of Current Developments in Central Europe," Proceedings, 42nd Earthmoving Industry Conference, Peoria, IL, 9-10 April 1991, Society of Automotive Engineers Technical Paper Series 910962. (Work was done using the European CEC-L-33-T-82 test procedure.)

**Errichello 1995**

Errichello, R., and Muller, J. May/June 1991. *Ten Myths About Gear Lubrication*, Gear Technology, Vol. 12, No. 3, p 18.

**Firestone 1997**

Firestone, C. M. May 1997. *Exclusive Guide to Synthetic Lubricants*, Plant Engineering.

**Fisher 1991**

Fisher, J. May 1991. *Water Hydraulics Getting Hot Again*, Hydraulics and Pneumatics.

**Fogel 1996**

Fogel, G. August 1996. *Minilab Approach to Inhouse Oil Analysis*, Plant Engineering.

**Fukunaga 1990**

Fukunaga, K. September 1990. *Grease for Gear Lubrication*, Lubrication Engineering, Vol. 46, No. 9, p 557.

**Jentgen 1971**

Jentgen, R. June 1971. *Solid Lubricants: How They Work and Where to Use Them*, IEEE Transactions on Parts, Hybrids, and, Packaging, Vol. PHP-7, No. 2.

**Kiovsky, Murr, and Voeltz 1994**

Kiovsky, T. E., Murr, T., and Voeltz, M. November 1994. *Biodegradable Hydraulic Fluids and Related Lubricants*, International Truck and Bus Meeting and Exposition, Paper 942287.

**Korane 1996**

Korane, K. J. February 1996. *Keeping a Watchful Eye on Hydraulic Contamination*, Machine Design.

**Lauer 1996**

Lauer, D. A. July 1996. *Alternative Lubrication Methods for Large Open Gear Drives*, Lubrication Engineering Vol. 52, No. 7, p 515.

**Mediate 1997**

Mediate, J. September 1997. *Using Wireless Communications to Automate Plant Maintenance*, Plant Engineering.

**Newingham 1987**

Newingham, T. D. July 1987. *Hydraulic Fluid - the Often Overlooked Component*, Hydraulic and Pneumatics.

**O'Connor 1966**

O'Connor, J. J. August 1966. *Lubricants*, Power, Vol. 110, No. 8.

**Rhee 1996**

Rhee, In-Sik. August 1996. *Evaluation of Environmentally Acceptable Hydraulic Fluids*, NLGI Spokesman, Vol 60, No. 5.

**Scheels 1994**

Scheels, R. H. February 1994. *The New Challenges for Hydraulic Fluids*, Hydraulics and Pneumatics.

**Scheffels 1996**

Scheffels, G. December 1996. *Developments in Water Hydraulics*, Hydraulics and Pneumatics.



**Skoog 1991**

Skoog, P. N. November 1991. *The Care and Maintenance of Water Glycol Hydraulic Fluids*, Hydraulics and Pneumatics.

**Stevens 1995**

Stevens, C. August 1995. *Lubricant Selection Vital to Maintenance Solutions*, Plant Engineering.

**Straiton 1998**

Straiton, J. 1998. *Synthetic Fluids*, Exxon Lubricants Maintenance Conferences.

**Stricker 1996**

Stricker, S. December 1996. *Advances Make Tap Water Hydraulics More Practical*, Hydraulics and Pneumatics.

**Texaco 1996**

Texaco. 1996. *Hydraulics*, Lubrication, Vol. 82, No.1.

**Thibault 1993**

Thibault, L. May 1993. *Taking Care of Enclosed Gear Drives*, Chemical Engineering, Vol. 100 , No. 5, p 145.

**Thibault and Kolonco 1993**

Thibault, L., and Kolonco, J. July 1993. *Gear Drive Life, Performance Affected by Appropriate Selection of Lubricant*, Pulp and Paper, Vol 67, No. 77, p 91.

**Tribble 1995**

Tribble, J. February 1995. *Spillway Gate Roller Chains*, Hydro Review, Vol. XIV , No.1, p 90.

**Watkins 1997**

Watkins, J. P. July 1997. *Going Beyond CMMS: Blending Preventive and Product Predictive Techniques to Optimize Maintenance Operations*, Plant Engineering.

**Weimshelbaum 1968**

Weimshelbaum, M. 1968. *Proceedings, National Conference on Fluid Power*, VXXXIII: 269.

**Wessol and Whitacre 1993**

Wessol, A. A., and Whitacre, B. January 1993. *Operating Hydraulics on “ Green” Fluids,”* Machine Design.

**Wills 1980**

Wills, G. 1980. *Lubrication Fundamentals*, Marcel Dekker, New York, pp 75-87.

**Zingaro 1994**

Zingaro, A. April 1994. *Walking the Fluid Cleanliness Tightrope, Part I*, Hydraulics and Pneumatics.

**Zingaro 1994**

Zingaro, A. December 1994. *Walking the Fluid Cleanliness Tightrope, Part II*, Hydraulics and Pneumatics.